CLAIMS

1. A system for detecting abnormality of a mobile robot having at least a drive motor, an internal sensor that senses a quantity of state of the internal of the robot and a control unit constituted by an onboard microcomputer that operates the drive motor based on the quantity of state obtained from an output of the internal sensor to move, the control unit comprising:

a. self-diagnosis means for self-diagnosing whether the quantity of state is an abnormal value, or whether at least one of onboard equipments mounted on the robot including at least the drive motor and the internal sensor is abnormal;

b. abnormality information outputting means for outputting, when an abnormality is self-diagnosed by the self-diagnosis means, information of the abnormality;

c. abnormality degree discriminating means for inputting the output of the abnormality information outputting means and for discriminating degree of abnormality based on the abnormality information; and

d. stable state driving means for driving the robot into a stable state in response to the discriminated degree of abnormality.

2. The system according to claim 1, wherein the stable state driving means drives the robot into a stable state in response to the discriminated degree of abnormality based on a predetermined action plan chart.

3. The system according to claim 1 or 2, further including:

e. abnormality degree storing means for storing the discriminated degree of abnormality in an internal memory provided in the control unit and in an external memory provided outside the robot.

4. The system according to claim 3, wherein the abnormality degree storing means stores the output of the abnormality degree discriminating means and a parameter indicative of the quantity of state of the robot, in an internal memory provided in the control unit and in an external memory provided outside the robot.

5. The system according to any of claims 1 to 4, wherein the control unit includes:

f. dynamic model behavior correcting means for inputting at least a desired manipulated variable, and based on a dynamic model which outputs a desired behavior of the robot, that is a plant, such that the desired manipulated variable is satisfied, correcting the behavior of the dynamic model, by additionally inputting a correction amount of the desired manipulated variable determined in response to an error in the quantities of state of the dynamic model and the robot to at least the dynamic model; and

g. control means for controlling operation of the drive motor so as to follow the behavior of the dynamic model;

and the self-diagnosis means self-diagnoses that the quantity of state is an abnormal value when the error in the quantities of state of the dynamic model and the robot is not within a predetermined value.

6. The system according to any of claims 1 to 5, wherein the robot has a body and a plurality of leg linkages each swingably connected to the body through a joint and each connected with a foot at its distal end through a joint, the internal sensor includes an inclination sensor that generates an output indicative of an inclination of the body of the robot relative to a vertical axis, and the self-diagnosis means self-diagnoses that the inclination sensor is abnormal when the output of the

inclination sensor is not within a predetermined range.

7. The system according to any of claims 1 to 6, wherein the robot has a body and a plurality of leg linkages each swingably connected to the body through a joint and each connected with a foot at its distal end through a joint; the internal sensor includes an angle detector that generates an output indicative of at least one of an angle, angular velocity and angular acceleration of the joints, and the self-diagnosis means self-diagnoses that the angle detector is abnormal when the output of the angle detector is not within a predetermined range.

8. The system according to any of claims 1 to 7, wherein the onboard equipments include an external sensor that generates an output indicative of taken images.

9. The system according to any of claims 1 to 8, wherein the onboard equipments include a floor reaction force detector that detects a floor reaction force acting on the robot, and the self-diagnosis means self-diagnoses that the floor reaction force detector is abnormal when the output of the floor reaction force detector is not within a predetermined range.

10. The system according to any of claims 1 to 9, wherein the onboard equipments include sensors that detect a current supplied to the drive motor and a temperature of the drive motor, and the self-diagnosis means self-diagnoses that the drive motor is abnormal when at least one of the detected current and temperature is

not within a corresponding one of predetermined ranges set respectively with respect to the current and temperature.

11. The system according to any of claims 1 to 10, wherein the onboard equipments include a battery that supplies a current to the control unit and the drive motor and a voltage sensor that generates an output indicative of a voltage of the battery, and the self-diagnosis means self-diagnoses that the battery is abnormal when the output of the voltage sensor is smaller than a predetermined value.

12. The system according to any of claims 1 to 11, wherein the onboard equipments include a voice recognition system that enables voice communication with an operator.

13. The system according to any of claims 1 to 12, further including:

h. an operator's operation control unit provided outside the robot and comprising a microcomputer that includes the external memory; and

i. communication means connecting the control unit and the operator's operation control unit for establishing communication therebetween;

and the self-diagnosis means self-diagnoses whether the communication means is abnormal.